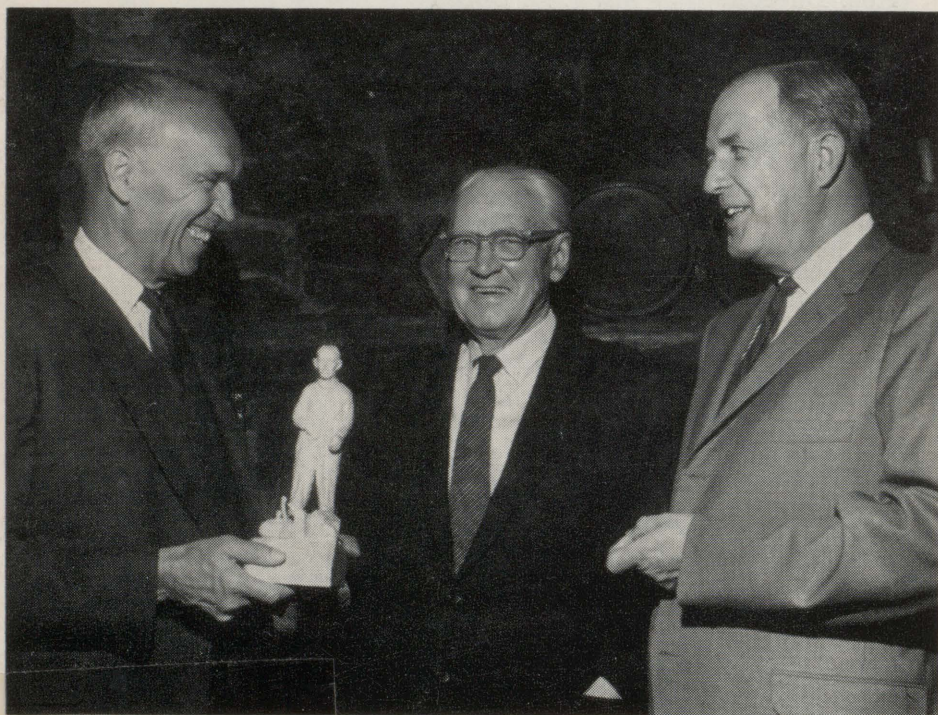


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THE
DEPARTMENT OF WOODLOT MANAGEMENT
MACDONALD COLLEGE
AND
**THE MORGAN ARBORETUM
ASSOCIATION**



Retiring President Fred Harrison holds wooden self-sculpture presented on his retirement. Dr. Brittain (centre) and new President, Bob Kirkpatrick look on.

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ANNUAL REPORT
to 31st May, 1969

MACDONALD COLLEGE LIBRARY

MORGAN ARBORETUM ASSOCIATION
AT MACDONALD COLLEGE, P.Q.

Executive Officers 1968-1969

Hon. President:	Dr. Vernon E. Johnson
President: - retired	Dr. F. A. Harrison, (retired Dec. 31, 1968)
President:	Mr. R. E. Kirkpatrick, General Manager, Woodlands, Consolidated Bathurst Ltd. (from Jan. 1, 1969)
Vice-President:	Mr. T. R. Lee
Sec.-Treasurer:	Mr. W. C. Shipley, Registrar, Macdonald College
Hon. Director:	Mr. S. H. Dobell

Directors — Morgan Arboretum Association

Mr. Lowell Besley	Dr. Louis G. Johnson
Dr. R. I. Brawn	Mr. R. E. Kirkpatrick
Dr. W. H. Brittain	Mr. T. R. Lee
Dean H. G. Dion	Mr. J. C. Merrett
Mr. John A. Fuller	Mr. J. B. Morgan
Dr. F. A. Harrison	Mr. Robert Raynauld
Mr. R. A. Irwin	Dr. H. Rocke Robertson, Principal
	Dr. G. H. Tomlinson

Staff — Department of Woodlot Management

W. H. Brittain, Ph.D. (Cornell), D.Sc. (U.B.C.), B.S.A., LL.D., F.A.I.C., F.R.S.C., Scientific Adviser.
A. R. C. Jones, B.Sc.F. (Tor.), M.Sc. (Syr.), Associate Professor and Chairman.
J. D. MacArthur, B.Sc.F. (U.N.B.), Assistant Professor and Curator.
J. R. Bider, B.Sc., M.Sc., Ph.D. (Montr.), Assistant Professor, Wildlife Biology (Huntly-Drummond Fund).
Miss M. E. Munro-Kerr, Office Manager.
Mrs. Dorothy Robertson, Secretary
David Algar, B.Sc.F., Research Assistant.

Staff — Arboretum

R. J. Watson, Foreman.
G. S. Martin, Technician.
H. R. Brevoort, Technician.
R. M. Irwin, Nursery Technician. (from Jan. 1969).
R. Magill, Technician. (from Jan. 1969).

THE DEPARTMENT OF WOODLOT MANAGEMENT MACDONALD COLLEGE

It is a pleasure to present the highlights of the year's (1st June, 1968 to May 31st, 1969) activities to the membership.

Membership

At the end of the year, contributions to the maintenance of the Arboretum and the expansion of its educational and scientific programmes stood at 859 individuals and families, 40 corporations and associations, 19 honorary members including the Honorary President and Director, with a total of 163 new members in all categories with 6 of these being in the corporation class. The continued support of the Arboretum's programme by private citizens and corporations is appreciated and vital to its survival. The increasing use of the area for recreation and educational visits has placed a heavy burden on our small staff, but is tangible evidence of the need for continuing and intensifying the educational programme. Comments and participation in the various events by the membership has been most gratifying.

At the end of December Fred Harrison took a well-deserved retirement from the office of President. Fred has capably held the office for the past seven years and has been instrumental in building up the Association through his many contacts and prestige with the forest industry. His leadership and long association with the Morgan Arboretum will be sorely missed and our sincere thanks go out to him for his dedicated efforts on behalf of the Association. Fred was awarded the coveted Rielle Thomson Award at the March Meeting of the Canadian Pulp and Paper Association, Woodlands Section. The Award is presented to a person who has made an outstanding contribution to public knowledge of the forest.

I am very pleased to welcome Mr. R. E. Kirkpatrick of Consolidated-Bathurst Limited to the Presidency of the Association — commencing January 1st, 1969. Bob Kirkpatrick has shown a keen interest in the Arboretum and its work since taking office and many of the members have already met him and Mrs. Kirkpatrick at one of the winter or spring outings of the Association. Bob is General Woods Manager of Consolidated-Bathurst Ltd. and his knowledge and wide experience in forestry will be invaluable to the continued progress of the Association.

It is difficult in this brief summary to mention all those who have helped during the past year. However, sincere thanks are hereby expressed to all the Directors and members who have given generously of their time and talents to advance the goals of the Association and to continue their support. Demands for information on all aspects of renewable natural resources continue to be received and it is felt that in answering these questions and through their writings and addresses the staff have made a valuable contribution to the knowledge of conservation in the Province. I must advise the membership of the passing of some old friends and long-time supporters of the Association. Ruth Abbott, a former Secretary of the Department, died at her home in Senneville on April 6th. She had a long and enthusiastic interest in the affairs of the Association and supported it from the start. She was largely

responsible for developing in the early years the model of service which I hope still characterizes the work of the Association. She was appointed an Honourary Member in 1966 following her retirement. She was also Honourary President of the Province of Quebec Society for the Protection of Birds, one of her lifelong interests and served as Honourary Secretary of the Society. She and her sister Phyllis were responsible for organizing and directing the annual field trips of the Society to the Morgan Arboretum for many years. To all members of her family we extend sincerest sympathy. Alan Johnson who died in December was a strong supporter of the Association and a keen practising forester. Mr. Johnson was desirous of donating his unique forest property near Dalesville to the University to expand the Department's facilities for the study and training of students interested in renewable natural resources. Unfortunately, despite the magnificent efforts of Vernon Johnson and Fred Harrison, the funds to support such a generous gift were not obtained and his property was sold. Mr. Johnson's sincere interest in conservation and the work of the Department will be sorely missed and we are confident that the results of his dedication to forestry will long remain a fitting memorial to him.

Staff

I am sorry to have to report that Dr. Brittain had to take an enforced rest in the Lakeshore General Hospital in March. He is now at home after spending about a month in hospital on two occasions and undergoing some surgery. Prior to this attack he had been very busy with his *betula* studies supported by a National Research Council Grant. He made an extensive collecting trip in the East last summer and also spent some time on Grand Manan in the Bay of Fundy. He has had two technicians working on these collections during the year — Mrs. Peggy Austin and Mrs. Janet Fisher. The results are being published in the Canadian Naturalist in cooperation with Dr. Grant of the Genetics Department. Recent articles are listed in the "Publications" section of this report.

Professor Dan MacArthur continued his many duties as Curator of the Arboretum, as Assistant Professor of Woodlot Management and as Woodlands Editor of the Pulp and Paper Magazine of Canada. He had an unfortunate skiing accident this spring which sidelined him during the latter part of the sugaring season but he is now getting around again — albeit still on crutches at the time of writing this report. Besides the above assignments he directed the maple research and field trials which are becoming more sophisticated and complex. He is also conducting research on maple silviculture, has organized the plant sale catalogue, several sugar parties and members outings during the winter which were well attended. He has been in demand as a speaker on numerous occasions and has participated in radio and television broadcasts — on maple, woodlot and reforestation subjects. He addressed the following technical meetings and groups: the Seventh Conference on Maple Products, Agricultural Research Service, in Philadelphia in October — describing the Department's maple research results; The 20th Annual Meeting of the International Shade Tree Conference in Montreal in February — the title of his paper was "Use of Trees in Landscaping and Beautification". Professor MacArthur was a member of a panel of speakers on the topic "Coordination, the Key in Forestland Management for

Optimum Use" at the 51st Annual Meeting of the Woodland Section, Canadian Pulp and Paper Association in Montreal in March. His presentation, "An Example in Coordinated Use", at this meeting pointed out some of the highlights of the Arboretum program in which outdoor recreation, forestry and other uses were compatible in the Morgan Arboretum's 600-acre woodlands on the Montreal Island. He also demonstrated to the many representatives of forest industry attending that the income per acre from recreation-oriented land uses could substantially exceed wood incomes if intensive management was practised. In addition to the above conferences in which he played an important part, Professor MacArthur has also contributed to the following field trips and meetings during the past year. As Chairman of the Champlain Section of the Canadian Institute of Forestry, Professor MacArthur arranged two successful meetings during the year — one a forest recreation meeting in Ste. Agathe in June during which the delegates were given a tour of Bill Pollock's interesting private forest management project — and the second, at the Montmorency Experimental Forest of Laval University. The seminar type meeting featured the appearance of guest speakers whose views were calculated to generate controversy. For example the President of the Algonquin Wildlands League, Mr. Abbott Conway put, and defended, the case for recreation as opposed to industrial forestry in Algonquin Park.

Professor MacArthur also participated in the following conferences: A special Woodlands Section (C.P.P.A.) Conference on "Multi-product integrated logging" held in Montreal; The Canadian Institute of Forestry Annual Conference in Newfoundland. The theme, "New Forests for Old" was explored from many angles — from afforestation of peat lands to demonstrations of water bombing by aircraft; Woodlands Section (C.P.P.A.) Forest Management Conference. A field meeting held at Kirkland Lake, Ont. with the Ontario Department of Lands and Forests as joint sponsor. A number of excellent papers and field demonstrations were given on large scale artificial reforestation. He conducted delegates to the International Poplar Commission on a visit to the Morgan Arboretum to see the various poplar species and varieties in the collection. Many countries were represented and the natural forest flora proved more interesting than the poplars to a number of delegates.

Professor MacArthur also gave the following talks: "Concerning Trees" to the Lake of Two Mountains Garden Club at Hudson Heights; "Bleeding Hearts and Mediaeval Ravishers", on conflicts between different groups of forest users to geography teachers of the Protestant School Board of Greater Montreal, followed by a field trip in the Morgan Arboretum.

Dr. Roger Bider will complete his fourth year with the Department in September. He has been very busy with course work and research and he is currently directing the studies of seven graduate students working at Lac Carré in the Laurentians and in Newfoundland. In addition to this heavy schedule, Dr. Bider has found time to attend the following professional meetings: Quebec Wildlife Federation in November in Montreal; Canadian Society of Wildlife & Fisheries Biologists in January in Winnipeg; North American Wildlife and Natural Resources Conferences in March in Washington; Canadian Wildlife Federation in March in Ottawa.

Dr. Bider also spoke at the following conferences: "Tracks & Tracking", Yamaska-Conservation Club, Waterloo, Quebec, in October; "Wildlife & Forestry", C.I.F. Ottawa Valley Section of the Canadian Institute of Forestry in Ottawa; "The Deer and its Habitat", a panel discussion chaired by Dr. D. H. Pimlott and discussed by Dr. Bider, Mr. Passmore and Mr. Stephenson. (Dr. Pimlott, Dr. Bider and Mr. Passmore, Executive Director, Canadian Wildlife Federation spent the late winter of 1967 studying and reporting on the situation vis-à-vis the deer population of central Quebec for the Department of Tourism, Fish and Game).

He is also participating actively on the following committees and organizations: Subcommittee on the Use of French at McGill; Chairman, Sessional Dates Committee; Fisheries and Wildlife Study Group, Science Council of Canada; This latter work with the Science Council commenced this May and with two other experts in this field, Dr. Pimlott and Dr. Kerswill, he is preparing a Science Council study report. This involves meeting with wildlife and fisheries resource specialists across the country to outline the status, adequacy and desirable future developments pertinent to the present or future state of fisheries and wildlife resources in Canada. Nationally this is an extremely important assignment that will prepare guidelines for future policy and proposed developments in fisheries and wildlife resources.

The undersigned, beside his administrative and teaching duties, visited the University of Toronto graduate course "Ecological Land-Use Planning" in July directed by G. Angus Hills held in Simcoe County, Ontario; attended the seminar on Sugar Maple convened in Houghton, Michigan at which 54 speakers covered the subject in considerable detail. A paper "The Quebec Maple Story" was presented in Malone, N. Y., to the producers attending the annual New York Maple Producers Tour which also visited Huntingdon County Maple Producers in August. The following conferences were attended: The Canadian Botanical Association's annual meeting and field excursion in the Boreal Forest held at Lakehead University at Port Arthur; the annual meeting of the Canadian Institute of Forestry in St. John's, Newfoundland; the Canadian Forestry Association's Woodlot extension Seminar held at the C.I.P.'s Harrington Forest Farm during October; also attended the Corporation des Ingenieurs Forestiers Annual Meeting in Quebec; the Seventh Conference on Maple Products in Philadelphia; The Conservation Council of Ontario Seminar on "Conservation in a Changing World" which discussed some of the frightening challenges facing conservationists in the years ahead; and the Canadian Pulp and Paper Association Woodland Section Annual Meeting in Montreal; addressed seventy members of the Southwestern Quebec Protestant Settlement Society in Franklin Centre in early March on "New Trends in the Maple Industry". The undersigned has also been appointed to the Conseil d'Administration of the Corporation des Ingenieurs Forestiers and an associate member of the National Maple Syrup Council.

John Ambrose, a graduate student in Forestry, started his studies in the Department last September. He is conducting research to determine the potential productivity of soft maple stands on poorly drained soils in southwestern Quebec. David Algar has also prepared a Morgan Arboretum publication entitled "Guide to Woodlot Harvesting", in French and English, for cooperators in the Chateauguay Valley project. The publication is also available to other interested woodlot owners.

The Department also acted as host for the joint Northeastern Forest Tree Improvement Committee — Canadian Forest Tree Breeders Committee Conference held at Macdonald College, August 8 - 10. This Conference brought forest geneticists from all parts of North America and the Arboretum was visited in the field trip which concluded the meeting. It was a pleasure to see some old friends of the Arboretum at this meeting among them Dave Cook who has supplied us with some very fine hybrid larch progeny from his own selections near Albany, New York. The Arboretum was also visited by 30 delegates attending the International Poplar Commission Meetings in Montreal during September. A members' field day and demonstration was held in mid-December and a good number came out to learn about the safe use of woodlot cutting tools. Department staff, namely Professor MacArthur and the undersigned, have also participated in several of the Manpower Training Courses held on campus during the past year. These courses are held by the Centre for Continuing Education with the purpose of providing a source of trained personnel who can conduct courses for the retraining of farmers.

Bob Watson, the Arboretum foreman, has been kept very busy this year with a host of activities that involve: maintenance of the Arboretum and its equipment, supervising the numerous research projects, upkeep of nurseries and arboretum groups, supervising wood production and purchases, maple syrup manufacture, Christmas tree sales and purchases, plant sales, sugar parties and tours, gatekeeping and protection of the property from vandalism, theft, litter and trespass. In addition to the above he continued to coach the Macdonald Woodsmen at the fall meet in Fredericton and the Winter Carnival Intercollegiate Competitions. Although not bringing home any trophies this year, they had a very satisfactory season.

Gatekeeping records for the week-ends from June 1, 1968 to May 31, 1969 are as follows:

GATE RECORDS AND RECEIPTS

June, 1968 — May, 1969

<i>Month</i>	<i>Members</i>	<i>Paying visitors</i>	<i>No. turned away</i>	<i>Groups</i>	<i>Gate- keepers hours</i>	<i>Gate Receipts</i>
June	334	104	275	295	78	\$52.00
July	254	52	164	171	61	26.00
August	623	129	239	326	88	64.50
September	833	215	219	522	64	107.50
October/Nov.	1410	466	302	802	88	233.50
April	375	74	223	271	24	42.00
May	837	129	318	601	60	64.00
Totals	4666	1169	1740	2988	463	\$589.50

Expenses totalled \$463.00 with receipts from passes sold at the gate amounting to \$589.50. This year for the first time costs of manning the gate on week-ends was exceeded by receipts. At least 9,823 persons have visited during the week-ends alone.

The above numbers do not include the many educational groups that have been taken through during the week. Well over 10,000 school children have been introduced to conservation in the area, in addition to those who have registered at the gate during the week-ends or others who come in during the winter week-ends when the gate is not manned. A large increase has been noted in the numbers of persons and families who have been visiting during the winter week-ends when the weather is not too stormy.

I am pleased to welcome back to the work force Dick Irwin and Bob Magill who successfully completed their forest technician training at Dorset, Ontario and Fredericton, New Brunswick at the end of 1968.

Galen Martin and Harold Brevoort, the members of the Arboretum permanent work crew, have provided the manpower for the regular seasonal activities in the property. As before they have carried out the work assigned to them conscientiously and thoroughly and their continued cooperation and assistance is much appreciated.

Last but not least I would like to thank the hardworking office staff under the direction of Miss Munro-Kerr ably assisted by Mrs. Dorothy Robertson for their loyal contribution to the continuing development of the Department and the conduct of Association affairs. They must contend with an ever-increasing burden of work on top of a constant flow of telephone enquiries, requests for information, plant orders and membership details, student queries, not to mention the demands of an absent-minded staff member or two looking for back correspondence or information that is more often than not buried on their own desks. Their continued good-natured forbearance in light of these demands for their services is most gratefully acknowledged. The Department also lost the services of a very able secretary in the person of Mrs. Jean Lovell when she moved to the United States in the late summer and we wish her every success.

ARBORETUM SPECIAL EVENTS

Following the fall field day in December which was well patronized by the membership, it was decided to hold several winter outings for those interested in skiing, snowshoeing, winter birdwatching, hiking, etc. A ski-touring outing for members of the Alpine Club of Canada and others was held in early January with the purpose of acquainting cross-country skiers with the many different touring trails on the property. This was followed by two "open-chalet" sessions on February 9 and March 9 at which coffee was served. Both of these events were well attended and many members took advantage of the facilities at Chalet Pruche to picnic and enjoy the winter landscape. Spring events included the annual sugar party and the plant sale described below. The members sugar party was a sell-out with an estimated 1400 to 1500 persons in attendance. In future it will be necessary to sell tickets in advance for this affair in order to see that members who bring visitors pay for them at the gate. The cooperation of the membership in paying for their guests has always been assumed but the experience with a few this year has indicated that many guests are not registered. The size of this party (free to members) now makes it imperative that members' guests pay their way.

OPENING OF WILDLIFE BIOLOGY FIELD LABORATORY

On September 15 at Lac Carré in the Laurentians, the formal opening of the new field lab built with materials provided through the kindness of the Montreal Anglers and Hunters Inc. took place. The laboratory was constructed on property owned by Dr. Bider with the help of some of his students who have their research projects there. The following description of the area was provided by Dr. Bider:

"Beginning in 1953 a farm and woods at Lac Carré were used for fish culture and lake management. By 1958 a small group of field biologists from the Université de Montréal began to use the area for exploratory field studies on snakes and small mammals. Until the Université de Montréal field station at St. Hippolyte was built the area was also used for undergraduate field laboratories in ecology. In 1962 Dr. Bider began a research program in community ecology using a sand transect tracking technique. The technique produces data on where, when and under what climatological conditions animals are active (from spiders to moose), and how the activity of one species affects that of others. This program has continued to develop and many specific projects have evolved. In 1965 Dr. Bider was appointed Assistant Professor Wildlife Biology in the Department of Woodlot Management at Macdonald College, and a year later a vigorous program in Wildlife Biology began. To date one student has completed his M.Sc., five will complete them in 1969 and at least one will finish in 1970. Through all this the undergraduates have not been forgotten. Undergraduate courses in wildlife biology began in 1965 and an intensive week of field studies prior to the opening of the 1967 session was established.

"This year 4 graduate students and one assistant have worked at the station all summer and 2 other assistants worked part time. Two professional biologists used the area to collect data, and 29 graduate and undergraduate students and staff are participating in the 1968 field exercises. This year it was obvious that all space available both for residence and for processing of field data was overflowing, and the Montreal Anglers and Hunters were approached to help finance the construction of a small laboratory. The Montreal Anglers graciously supported this request and students at the field station enthusiastically built the laboratory. The quarters now available will aid the field program and enhance the wildlife research potential of the vast Laurentian area.

"The aims of the formal opening are threefold, 1) it is a small gesture of appreciation to the Montreal Anglers and Hunters Inc. who donated the funds to build the laboratory, 2) it is an opportunity for a group of people truly interested in the wildlife of our Province to get together, and 3) it is an opportunity for guests to meet a group of research students and see what kind of work is being done."

JAMAICA FORESTRY

The undersigned had an opportunity to visit Jamaica in January to examine the future forestry potential of the island in order to forecast transportation trends for forest products for a Montreal firm of trans-

portation experts commissioned by the Canadian office of external aid. Several members of the College Staff were involved in these studies and the remarks which follow briefly outline some of the problems and programs underway.

GENERAL DESCRIPTION AND FORECASTS

Forestry

There are 810 square miles of land classified as forest in Jamaica, 18.4% of the total land area of the island. Government owned lands within this figure are some 422.4 square miles or 9.8% of the total area, while privately owned forests are estimated at 377.2 square miles or 8.6%. The Government forests are comprised of a) Crown Forests and b) Gazetted Forest Reserves both of which are under the control of the Forest Department of the Ministry of Rural Land Development.

The Forest Department is gradually expanding the area under Gazetted Forest Reserves by 100 to 200 acres per year. No exploitation of these reserves is permitted except by permit on a marked tree basis for which a set schedule of royalties had been established since 1945. The major parts of these new reserves come from Crown lands or lands that have been declared idle. Crown Forests are lands owned by the Government but on which no current forestry activities are underway — in some cases these are subject to trespass and periodic timber theft and burning for local charcoal and firewood production.

The gazetted Forest Reserves are divided into three divisions — Western, Central and Eastern which closely correspond to the main county divisions. The major areas of as yet unexploited natural forest occur in the Blue Ridge and John Crow Mountains in the east and the Cockpit Country of the west which extends into the central division in the Dry Harbour Mountains and Mount Diablo regions. Besides these areas where forestry for timber production is uppermost there are two areas — the Yallahs Valley and the Christiana Area Land Authorities where protection forestry has played its part in improving the agricultural potential. As a result of the initial success of these latter ventures, a further 13 to 14 authorities, patterned on these two, are planned by Government to include most of the remaining important agricultural regions of the island.

The Jamaican economy is strongly oriented to food production and for this reason forestry takes second place. The severe over-exploitation of accessible forests in the past for subsistence agriculture bears ample witness to this fact. Forest policy is directed toward the expansion of the Forest Reserves, reforestation of unproductive lands within the reserves and where possible on private lands unsuited to agriculture, the construction of roads to open up the considerable reserves of native timber with the overall emphasis on increasing local timber production to reduce the large volume of imported wood and allied products (valued in 1967 in excess of £9 million). Another facet of this policy is the provision of employment in rural areas where chronic unemployment exists.

Outside the Forest Reserves lie the private forests of considerable but uncertain extent and condition. Much of this land is in "ruinate" (a Jamaican term for secondary scrub and depleted forest) and most

of it is treated in a haphazard manner with little sustained production other than such minor forest products as fence posts, yam sticks, rafters and charcoal. This land also produces 30,000-40,000 railway ties and unknown quantities of round timber for local sale or remanufacture.

The island's needs for wood for construction and furniture manufacture are met largely from imports. During the last five years (1963-1967) the value of wood imports including paper and wooden furniture have almost doubled. Only in the matter of firewood and railway ties is the island more or less self-sufficient. It is difficult to see this situation changing much in the next ten years — particularly with respect to imports of softwood and hardwood lumber and manufactures therefrom. Forecasts for wood product imports in 1973 and 1978 (based on the 1959-67 trend of actual costs of lumber importations) are placed at 18 and 28 million £s respectively. A serious attempt is being made by Government to replace these imports with products which could be readily grown on the island — softwood and hardwood timber. Jamaica's natural forests contain no indigenous conifers of commercial value but from the early twenties trials with exotic conifers from Mexico, Southern U.S.A., British Honduras and elsewhere met with indifferent success until the introduction of Carib pine, *Pinus caribaea* in 1955. Some exciting results have been achieved with this species on soils of low fertility and great variability. Carib pine now forms the backbone of the reforestation program. The expectations are that it takes an average twenty years to produce saw-timber size material. In 1968 there was an estimated 15,500 acres of timber plantations of which Carib pine comprised roughly 5,900 acres. Mahoe, *Hibiscus elatus*, a native hardwood formed close to 4,000 acres, Honduras mahogany, *Swietenia macrophylla*, 900 and other conifers and hardwoods the remainder. To meet the forecast consumption from locally produced timber it is estimated that close to 130,000 acres of plantation forests (80% pine and 20% hardwood) will have to be established in the next twenty years. At the present rate of reforestation (3,000 acres per year in 1968-69), consumptive requirements will not come close to being met in the next ten or even twenty years unless drastic increases occur.

In respect to hardwood timber, some substantial reserves of natural hardwood exist in the Blue Mountains in the east and the Cockpit Country of the centre and west. However these reserves are reported not to contain any great volumes of the hardwood species now imported in major quantities, i.e., mahogany and cedar. The exploitation of these resources is dependent on the development of a comprehensive road system, which may take between ten and fifteen years providing sufficient funds can be allocated to such an undertaking.

Plans are also afoot to establish 10,000 acres of protection forest in the next five years in the land surrounding Kingston. These forests primarily for protection and amenity can also serve to augment local timber supply and reduce the import bill.

A further important area of potential supply is that of private lands. To date there has been little inducement for forestry because of population pressures on the land for food crops. There is a Jamaican saying that "you can't eat a tree" — with the result that most accessible forest has been heavily cut and burned off in order to accommodate subsistence agriculture. It is estimated that there is now barely 1,000-2,000

acres of plantation forest in private hands — mostly in mahoe, mahogany and pines of various species.

In late 1966 the Land Development and Utilization Commission was established to inspect the land use of all lands in excess of 100 acres. If the owner is not prepared to develop his land by investing in the appropriate crop depending on the land classification, the lands are declared idle and can be sold or transferred to more active ownership. The owner is given four years to comply with a development plan based on the land capability classes. Of the 800,000 acres examined to date of an estimated total 1.1 million acres, 18 per cent is classed as Land Class V suitable for forests, unsuited for crops or pasture. Of the 46,000 acres for which development plans have been submitted (as of January 17, 1969) close to 10% (4,431 acres) report forest development intentions. If this ratio is maintained, an additional 100,000 acres of private land could be available for forest establishment in the next five years. If the Government is serious with respect to wood import substitution then an incentive program in the form of tax relief, planting and maintenance (for a three year period following establishment) assistance could provide further encouragement to private land owners to invest in forestry on lands unsuited to pasture and food production. If this were to take place these acreage estimates might well be surpassed. Three considerations are of immediate concern to the above proposal. First is the need to immediately expand seedling production if such a program is to be undertaken (assuming 800 seedlings/acre) a nursery increase of 80 million plants by 1974. Present plant distribution is of the order of 4 million plants per annum.

A second difficulty is the fact that although the majority of potential private forest in Land Class V may adjoin the Forest Reserves, in most cases it is widely fragmented in holdings of approximately ten to fifty acres. This fragmentation will certainly add to costs and reduce efficient harvesting when the time arrives. A third complication of considerable magnitude, if and when the timber plantations from the Forest Reserves and private lands commence to yield sawlog-size material in significant quantities, is the question of remanufacture. Present standards of lumber sawing, handling and seasoning are on the whole poor. The construction and furniture industries, etc., are now conditioned by imports to expect good quality, standard-sized products. To compete, local sawmills and any new ones that may establish will have to greatly improve present methods of log handling, sawing, resawing, trimming, seasoning and retailing, this, in spite of any price advantage their product may have over imports. This will be of major importance if plantation products are to come into their own.

Finally, in order to utilize the native timber resource that at the moment remains unexploited and deteriorating through overmaturity and decadence in the Cockpit Country and the mountainous regions of the east, access roads must be provided at an early date. Road development targets for 1969 have been advanced from 16 to 20 miles per annum. However, when 20 miles of new road is distributed over 26 Forest Districts it becomes insignificant. If the natural timber is to be exploited before it is too late (in 1962-1963 it was found that almost 20% of the marked trees felled in the Forest Reserves were too defective to be utilized) then the road program to provide access to this resource

must be accelerated considerably as well as being well-planned so that each mile of road opens up new territory in a permanent manner. Thus the natural timber can be quickly harvested and reforestation of suitable areas can proceed logically and rapidly.

What conservation and resource-use lessons can a Canadian derive from these problems and developments? In Jamaica they have shown great foresight in the rehabilitation of their mined-out lands; this is in striking contrast to the Canadian experience. The current methods, used by the Land Development Commission to ensure that absentee-owned land is properly utilized, are gradually bringing back into production some million acres of marginal agricultural land that has lain idle for many years. The problem of population control has not been so well handled; despite the efforts of a government sponsored family planning unit no significant effects on population control have as yet been achieved.

All of these measures are of course subject to abuse and unequal application to some degree — but results are being obtained which have important implications for Canadian renewable resource planning and development.

YOUTH GROUP TOURS

The Arboretum sugaring educational tours for school and youth groups have been once again most successful. Approximately 3,000 students in the primary grades have been conducted through the sugar bush on sugaring tours. These tours are terminated with a sugar-on-snow treat and have been most popular. The demand for these educational tours has been such that all the available dates were quickly sold out so that a good number of applications had to be turned away. The sugaring tours commenced on March 17 and terminated on April 18. Mr. Jeff Gidney was hired as tour guide and judging from the response from the schools he did a very satisfactory job. He was assisted by Wesley Weese. The strong response to the maple tours stimulated the development of a series of bilingual Nature Conservation Tours during May and June, commencing in the spring of 1968. The same programme was held in the spring of 1969 (from May 2 to June 20) and a circular, in French and English, has been sent to many schools in the Montreal region.

Because of the demand (200 students on opening day), it has been necessary to hire more guides this year. David Algar, B.Sc.F., working as a Research Assistant with the Department this year and under the Curator's guidance, has done an excellent job of organizing the nature tours, instructing guides and efficiently conducting this important work. David has considerable knowledge of flora and fauna and even arranged to have a flock of Canada geese fly overhead on two occasions and, on another tour, on pointing to a pile of rocks as good rabbit habitat, out hopped a large rabbit — to the delight of the students. The guides, recruited from several disciplines, are doing an excellent job. They are Joan Fisher, McGill, Penny Swales, Macdonald, Rick Dunn, Loyola, Julia Zarudzka, Macdonald, and Maggie Whittaker, Macdonald. At the conclusion of the tour the school students are given a small red

pine seedling in a peat pot and the teacher is provided with a kit of conservation information to follow up the outing in class. It is estimated that at least 9,000 students, both French and English up to Grade VIII, will see the Arboretum in this way during the spring of 1969. A questionnaire to obtain feedback on the teachers' estimates of the success of the tour is also provided and these forms have been full of praise and enthusiasm for the project. Walker Riley described the tours in his "Country Notebook" of June 9th as follows:

If you have ever watched the rapture on the face of a city youngster as a rabbit pops out of his shelter in a pile of rocks, or as a water spider performs its little miracle on the surface of a pond, you will know why the guides in the Morgan Arboretum, all university students, love their summer work.

Before the summer is over graduate forester Dave Algar and his five assistants will have conducted six thousand school kids through the College's 700 acre woodlot on the west end of Montreal Island and for these six thousand, life is sure to be just a little richer and the seed of respect for nature's creatures will have been sown.

Of course, a rabbit does not always pop out on order, or a flock of wild geese skim the tree tops on schedule, but the guides have become adept at weaving into their story whatever catches a youngster's eyes. Where mice have girdled a young tree, they show how the food supply to the branches is cut off. They point out how the stickiness is like antiseptic, keeping out bad germs. They show how moss slowly turns rocks to soil for trees, and trees in return provide moist shade for the moss.

They teach the youngsters that the forest is a quiet, friendly place, and have them lie on their backs under a pine, watching the blue sky through the needles, and listen. They explain that the bird's song is a call to his mate that he has found a nice piece of territory. (Personally, I like that interpretation better than the "don't-you-dare-come-into-my-property" theory). And they tell their animated questioners that, no this lump isn't because the tree has eaten too much; it is a disease like mumps.

You can be sure too, somewhere in the hour, a quiet lesson will be woven in about conservation, and multiple use of the woodlot.

The conducted tour program for school groups was started last year on a trial basis. Three thousand came. This year, the number will double or triple.

When you think of the stories told to mom and dad over the supper table, and add to this number those of the ten thousand school children who will visit the farm this year it seems the college is doing a job for agriculture and forestry, Sir William Macdonald never thought about when he founded the place back in 1905.

It may be too that in fifty years, you will not see Montreal or its suburbs for pines trees. Each youngster takes home a potted seedling tree to plant.

PRESENTATION TO RETIRING PRESIDENT

The attractive wooden figurine (see cover picture) presented to Fred Harrison on his retirement at the Annual Meeting was designed by Jim Watling of Macdonald College and carved from white pine by Yvan Maltais, Notre Dame du Rosaire, employed by Consolidated-Bathurst Ltd. The idea originated with Bob Kirkpatrick, incoming President, and Vernon Johnson, immediate past president, made the presentation to Fred with the following remarks which will be of interest to the membership:

"I was delighted when Arch Jones asked me to make a presentation today to our retiring president Fred Harrison, and I was more than pleased to accept. The Association, the Department and the Arboretum itself have been very close to his heart through the years — as they have been to mine — and besides his many major contributions to these causes, Fred has also been the moving force behind some outstanding achievements.

"As one who has been associated with the Arboretum from its early days and with the Association from its beginning, I have been in a position to note some major developments in our orientation. Perhaps we did start off on a moderate note, stressing the idea that trees were a crop. But in those days that was almost a revolutionary idea, and it certainly was never in our thinking to limit our efforts to the notion that woodlot management dealt only with a cash crop.

"A few years back, Arch Jones outlined the objectives of our Association in terms I doubt can be improved upon. He stated then, and it is true now, that our objectives are: 'To improve woodlot management practices on private forest lands (both farm and non-farm) in Eastern Canada, and by so doing to increase the production of wood and other goods and services, such as game, outdoor recreation, etc., from these lands. Improvement of woodlot management practices would also aid employment and income in rural areas and should also encourage multiple uses from these forest lands' (and here I want to include "how to grow trout" — so we must include water as part of forest lands).

Another objective is: "To stimulate a greater awareness of the pressing need for proper husbandry of all the renewable natural resources of forest, wildlife, soil and water, including outdoor recreation." And he added that "the Association can also help import a greater public understanding of the economic benefits that flow from the forest in the form of wildlife and recreation and the increasing importance of a stronger partnership of the forestry and agricultural interests in good land husbandry. It is also very important to keep the public well informed as to the good stewardship practised by many of the forest industries in the management of their timber, water and wildlife resources."

Well, that is what it is really all about. Our motivation is a vital concern for land and people. The new membership list shows public interest plus a lot of work by members.

I believe that the work we are doing today is proof that we have moved along with the times, and in many instances we have had the

ARBOR ACTIV 1968



1. Intercollegiate marathoners homeward bound during fall event through the Arboretum.



2. Jean Guilbault, Chief, Maple Products, Department of Agriculture, welcomes New York Maple Producers at Franklin Centre, Quebec.



3. Jamaica Forestry — Arthur Snaith examines three year old Alcan Caribbean Pine plantation.

RETUM VITIES 8-69



4. Hungry members line up at Arboretum sugaring-off party.



5. Arboretum Nature Guide Joan Fisher explains some of the mysteries of the outdoors to students.



6. Herman Smith Johannsen (Chief Jack Rabbit) visits the Morgan Arboretum.

responsibility of showing leadership in several fields. I think that the teaching of the total and multiple use elements of woodlot management and the stress we have placed on the natural resource aspects of the woodlot have been major accomplishments. And I feel strongly that the setting up of graduate study and research facilities for French-speaking students was no noble gesture — it shows that natural resource management is blind to everything but the ability of the expert and that we are developing experts for a common cause in our bilingual society.

As a veteran of the Association, I can look back over some of the more interesting highlights of our existence and I think a few of these may be of interest to our newer members.

The land which is now the site of the Arboretum was acquired by the College in 1946 as an addition to the farm area, and I would like to pay tribute to some of the people who had the vision, as well as the drive, to have these acres put to the most constructive and effective use possible. A great deal of the credit for what we have here today must go to Billy Brittain, Bart Morgan, and the late Garnet Strong and Frank Common.

By 1952, we had the Association going and held our first annual meeting, and in 1955 we felt solidly enough established to convince Arch Jones to take on the task of teaching woodlot management on a permanent basis. In 1957, we knew we were here to stay and decided to plant a time capsule which was not to be disinterred for 100 years. It was exhumed about 30 minutes later, however, when a tardy photographer insisted he get shots of the capsule being planted. Then, in 1958, McGill recognized woodlot management as an official course at Macdonald College and the Department of Woodlot Management became officially integrated into the Faculty of Agriculture.

In 1959, disaster almost struck in the shape of the Trans-Canada highway. While we were all in favor of new roads, we recoiled at the prospect of them coming right through the Arboretum. We made immediate representations to the government, and the late Prime Minister Duplessis, followed by the late Paul Sauvé, agreed with our arguments with the result that today both motorists and those who use the Arboretum are completely satisfied.

During those years also we provided maple syrup to Buckingham Palace, developed our own flag without too much debate and donated thirteen Canadian birch trees to Orly Airport in Paris, symbolizing Canada, the provinces and the territories.

In the spring of 1967, we were honored by the visit of the Commissioners General of Expo '67, headed by the late Pierre Dupuy. I don't know who dreamed up the menu, but a combination of pea soup, beans and wieners and maple syrup seemed to promote an uncommon, but general agility among these distinguished international representatives.

And perhaps the most meaningful ceremony of all came also in 1967 when His Excellency the Governor General and all provincial premiers or their representatives attended a ceremony on the McGill campus inaugurating the Canada Birch Trail. This to my mind was one of the

most significant of all Centennial projects in Canada and one that will last. Our hope is that Billy Brittain will soon be well enough to resume his quest in the far corners of the land. Here I must pay my respects to Billy Brittain for all of his accomplishments.

And now, Mr. Chairman, the moment has come for me to do my job. On behalf of all your fellow members in the Association, Fred, it gives me a great deal of pleasure to present you with this memento of the nearly nine years during which you guided our destinies. It goes to you with our thanks."

WOODLAND IMPROVEMENT

From year to year the amount of saleable wood produced by cutting operations varies. This past season a greater than usual part of the cutting effort was devoted to removal of dead elm trees. Cutting these elms, and other problem trees, consumed much time and effort without producing much for the market. However, there was a major improvement in appearance and safety in the areas treated.

Commercial type improvement harvesting continued in two blocks — both occupied by relatively young stands. After a one-year interruption, work in Block I was completed and Block XII (Skinner Grove) was started — to be completed in the 1969-70 season.

Three pine plantations were thinned — every third row now being cut. The pulpwood produced is given in the production table.

Wood Production

Hardwood firewood	64 face cords
Sugar Wood	10 standard cords
Pulpwood	21½ cords

Purchase Wood — For Resale

In addition to wood cut in the Arboretum, we have been purchasing wood from co-operators in the Woodlot Management research project in the Chateauguay Valley. Specifically this activity is intended to assist the progress of the project and generally to assist woodlot owners to market their wood. It is hoped that this activity will help develop the market and encourage owners to deal directly with buyers. It is not a profitable business for the Department but is believed to be a form of leadership in which we should be active.

Since September, 1968 we have stock-piled 104 cords delivered by 5 woodlot owners who are active in the management project. This wood will be delivered in the fall of 1969 along with the cut from the Arboretum.

NURSERIES AND PLANTATIONS

Work in both the nursery and the plantations increased. Expansions in the nursery were necessary to obtain space for the birch material and to increase the shrub and tree stock to meet the growing demands from members.

In the plantations thinning has commenced. The older red pine plantings were row thinned in the fall of 1968. Pulpwood, Christmas trees, and pine boughs were produced. In the broad-leaved plantations we have had to devote more attention than formerly to sale of surplus trees which permit profitable thinning. Sales of these reached a figure of about \$2,000.00.

Shearing of Scots pine Christmas trees has continued and we have made some sales of Arboretum grown Christmas trees. Spruce Christmas trees have also been sold from the Arboretum. Some of these came from thinning of successful plantations; others from a poor spruce plantation that is being liquidated. The better trees are saleable and a surprising demand for spruce Christmas trees exists.

Recent plantation establishment has been practically all the planting of the living collection of birches acquired by Dr. Brittain in connection with his special project.

Plant Sale

A late spring in 1969 favoured the members' plant sale. Plants were dormant when the orders were made up and there was a minimum delay between lifting and delivery. Stocks were lower than usual, partly because of winter losses (Climate and hare browsing) but available material was good quality.

Revenues from sales of trees and shrubs

Members' plant sale	\$1,550.00
Landscaping trees (plantation surplus)	3,500.00
	<hr/> \$5,050.00

Plantation Research

During 1968 regular observations and recording of growth data were continued for the wetlands ridge-planting experiment and the mixed plantations of Norway spruce and European larch.

In the Christmas tree plantations a project to analyse tree characteristics has been started. An effort is being made to analyse the interaction of the several characteristics which produces an aesthetically pleasing tree. This is proving to be a difficult but highly interesting problem.

Following row thinning in the red pine plantations, we expect to conduct studies of response to treatment. Initial measurements will be made in 1969.

Christmas Tree Sale

Sales of Christmas trees, pine boughs and birch firewood were brisk in 1968. Net revenues were about \$2,138.00 (see summary). Both sheared and unsheared Scots were sold plus spruce from the Morgan Arboretum. Sales of pine boughs remained at the same level as in 1967 but there was a marked increase in demand for birch firewood. In 1969 we will add high quality balsam fir to our Christmas tree offerings if a reliable supplier can be located.

Summary Christmas Tree Sale

<i>Item</i>	<i>No.</i>	<i>Revenue</i>
Christmas Trees		
Scots pine	1104	
Spruce*	193	
	1297	\$4,596.50
Pine boughs	535	535.00
Firewood	203	101.50
		\$5,233.00
Total Expenditure		\$3,095.00
Net Revenue		\$2,138.00

*All spruce cut in Morgan Arboretum thinning and salvage work

MAPLE ACTIVITIES

The 1969 sugaring season was short. The Arboretum staff were hard pressed but came through with great success. Syrup production was 475 gallons — considerably better than average and quality was excellent. Most of the syrup was made in about a two-week period.

Production Data 1960 — 1969

<i>Year</i>	<i>No. of taps</i>	<i>Galls. Syrup</i>	<i>Sugar/tap — lbs.*</i>
1960.....	2488	427.5	1.58
1961.....	2605	281.0	0.99
1962.....	2626 (150 P/L)	309.0	1.08
1963.....	2871 (480 P/L)	371.0	1.19
1964.....	2793 (911 P/L)	353.5	1.14
1965.....	2850 (932 P/L)	250.5	0.81
1966.....	2818 (728 P/L)	512.0	1.67
1967.....	3230 (930 P/L)	422.0	1.34
1968.....	3230 (1430 P/L)	370.0	1.15
1969.....	3230 (1658 P/L)	475.0	1.35

10-year Average to 1969..... 377

*Gals. of syrup x 9.2 divided by no. of taps.

Taps on tubing increased by about 200 through the inclusion of two sections around the wood field and the sugar house in the Quarry Grove system. Electricity produced by a portable generator was again used, this year without loss of any electric motors.

All the pumps used in 1968 were again in action namely the twin gear pumps in the north grove and the Hypro-Venture unit in Quarry grove. In addition we began testing a Model 500 Randolph pump which

operates on a different principle. Essentially it consists of a semi-circular housing around which a flexible tube is run. This tube is milked by impeller rollers to create a pumping effect. The sap passes through the tube and never comes in contact with any pump parts, nor is any churning effect possible. The simplicity of this unit is such that we feel it must be fully tested.

In the North Grove yields of sap from 6-inch and 18-inch drop systems were compared. This was a repeat of a 1968 test. Some confounding difficulties with pumps developed but again results seemed to be roughly the same. We feel that drop length between 6" and 18" are insignificant. One can use whatever is convenient within this range.

Once again elaborate preparations to study squirrel damage to tubing were largely wasted. There was very little squirrel damage to study in 1969. This characteristic of squirrel damage makes it extremely difficult to get results that would assist in solving the problem.

Tests of two Natural flow tubing methods occupied the four 60 tree test groves: Hamilton, East, Centre and Island. Twenty-four paired comparisons of Natural flow 18-inch drop vented and unvented systems were set up. Sap yield records were kept and the unvented installation produced about 15% more sap overall. There were interesting variations but in 18 of the 24 pairs the unvented yield was larger.

Superior yields from unvented systems have been ascribed to natural vacuum,¹ which develops in this type of installation. In our attempts to check on the natural vacuum we were able only once to get a reading — less than one inch. However, natural vacuum is probably intermittent and may be much less as slopes of lines decrease. Quite possibly the larger yields of sap obtained with unvented tubing are one result of low-level natural vacuum.

Our experimental lines have been mapped and we will attempt to relate line length and slope to differences in yield when time permits. We can, however, conclude that the unvented system is at least as good as vented and it is preferable because it is simpler to use.

In the long term sugar maple management project, the stand was cleared of undesirable trees which included some of the poorer sugar maple specimens. The first major selection of potential crop trees and their release is planned for the summer of 1969.

Support for maple research has been provided by several agencies. The Canada Dept. of Agriculture and Quebec Dept. of Agriculture and Colonization have provided grants that were of great value in starting and continuing research work. The tubing manufacturers have supplied materials and Gorman-Rupp pumps have generously placed an extremely useful portable electric pump unit at our disposal.

One highlight of the year in maple was the Seventh Conference on Maple Products, U. S. Dept. of Agriculture held in Philadelphia and attended by Messrs. Watson, Jones and MacArthur. One item on the

1 Blum, Barton M. 1967. Plastic tubing for collecting maple sap. A comparison of vented and unvented systems. U.S. For. Ser. Res. Paper NE-90

conference programme was a report on the Macdonald College Maple Research programme.

TELEVISION

Publicity for the Macdonald Winter Carnival saw the College Woodsmen appearing on the television programme "Like Young" where they demonstrated their virtuosity with the bucksaw. Morgan Arboretum foreman, Bob Watson, the team coach, was featured in the interview with the "Like Young" host.

During sugaring a C.B.C. TV mobile crew spent two days in the Arboretum shooting what became a half-hour show in the C.B.C. MOBILE series. Our major contribution was the work of Bob Watson who did an outstanding job of fielding the questions of Bob Brazil. The result was an excellent story on sugaring. The Arboretum sugaring activities were also featured on a 10-minute Channel 12 presentation this spring.

TEACHING PROGRAMME

Once again the Department was responsible for courses in Farm Forestry, Woodlot Forestry, Wildlife Biology, Ecology and Conservation and Vertebrate Morphology, the last in cooperation with the Department of Entomology. The Wildlife Biology course includes a six day field laboratory held in advance of registration at Lac Carré and permits the students to take their lab periods when insect and animal activities are still at their height. The Department has also held several lectures in the Faculty of Education for teachers interested in an introduction to Conservation of Natural Resources. The Arboretum youth group tours have been used as demonstrations for practical experience in this important teacher training.

WILDLIFE TEACHING — HUNTLY-DRUMMOND FUND

The wildlife biology and ecology courses given in the Department have continued to provide students in the Faculty of Agriculture in the General Biology option with training in this resource. There were 24 students registered in the Ecology and Conservation course (Biology 400b) and 10 in the Wildlife Biology (Zoology 400). In post-graduate work the following students and projects are involved:

- J. G. Doucet (M.Sc. I) — The effect of climate on rates of activity of the shrew (*Sorex*) under uncontrolled conditions. Unsupported.
- Y. Côté (M.Sc. II) — Growth movements and spatial utilization of a stream by brook trout (*Salvelinus fontinalis*) in a Laurentian stream. Montreal Anglers' Scholarship.
- L. Pellerin (M.Sc. II) — Ecology of the jumping mouse (*Napaeozapus insignis*). National Research Council support.
- R. Sarrazin (M.Sc. II) — Nouvelle méthode d'estimation de population basée sur l'activité. Completed spring 1969.
- D. Vernier (M.Sc. II). Ecology of the hare (*Lepus americanus*). National Research Council bursary.

Paul Thibault completed his M.Sc. degree in the fall of 1968. His thesis "L'activité animale près d'un ruisseau situé en forêt." He is now teaching at Ecole Normale Eulalie Durocher.

The two students who have completed their Master of Science degrees are both excellent research scientists but because of a shortage of research funds have not to date been able to pursue their studies to the Ph.D. degree or find appointments in research institutions.

In addition to his teaching and supervisor of research activities, Dr. Bider has been directing two research projects in the Arboretum. The study of rodent damage to maple sap tubing was continued this year with bi-weekly surveys of the permanent tubing lines over the winter to attempt to determine when the damage is occurring. This survey was continued through the sugaring season but no significant amount of damage occurred this year.

A population survey of the turtles in Stoneycroft Pond was also continued this spring with a trapping and tagging program. Following the collapse of the turtle population after pond blasting in 1967, a rapid reproduction of the turtle population from a spring count of ten in 1968 to a count of twenty-five in 1969 was noted.

WOODLOT ASSISTANCE — CHATEAUGUAY VALLEY

The following report outlining the progress of an assistance programme supported by Quebec A.R.D.A. is presented for the information of the membership:

Number of Co-operators

The programme now includes fifty-three resident and non-resident owners in Huntingdon and Chateauguay counties.

Management Planning

During the summer of 1968 a technician, Mr. Gene Goundry, visited most of the co-operators. He also evaluated and mapped fourteen areas that had been cut-over during the past year, in other words, one quarter of the owners had done some cutting during the year.

A scheme for categorizing and relating woodlot conditions, forestry objectives and woodlot owner objectives was developed during the winter. Woodlots are classified as to their monetary and biological condition. A given condition is then related to the owner's attitude and also to the forestry objectives which would produce it. This scheme aids a forester in supplying technical assistance to woodlot owners by illustrating the financial contribution the woodlot could make with a given management practice.

Since the scheme is partly based on productivity and the forestry concepts of preservation, conservation, sustained yield and high grading, it can be a basis for assessing how the level of forestry practice in the region interacts with the private owner's objectives and his socio-economic conditions and vice-versa.

In this connection a graduate student, Mr. John Ambrose, is doing basic research on soft maple productivity on poorly drained sites in the region. Mr. Ambrose's research is being supported in part by this grant.

Each owner has a range of objectives or alternatives which it is feasible for him to follow. A few alternatives have been stated for each owner. The field data to develop a practical management plan for each realistic alternative is presently being collected.

Visits this spring were primarily concerned with maple syrup production and the transfer of information between the producers and the project staff in addition to interviews and woodlot inspection of new co-operators.

Market Information

Market information was distributed in one of the periodic memorandums mailed to all woodlot co-operators. A questionnaire asking wood purchasing agencies to up-date to January, 1969, the prices in our 1966 marketing report was distributed. Out of 39 firms mailed questionnaires there were 25 replies.

Communication

Contact was made with the new agronome, M. J.D. Lalonde, in the reorganized Quebec Department of Agriculture and Colonization. Tours and meetings concerned with maple syrup production were organized through the Southwestern Quebec Protestant Settlement Society and other local farm organizations. A March meeting on the maple industry was held (sponsored by the Southwestern Quebec Protestant Settlement Society) at which Professor Jones and Mr. Algar provided the latest information on maple management, and marketing was discussed.

At present ten memorandums have been sent out to co-operators. The last one dealt with Christmas trees, maple syrup production and wood products marketing. An effort is made to advise co-operators of meetings being held in the region that are of current interest.

A booklet entitled "Guide to Woodlot Harvesting" in French and English was written by David Algar, B.Sc.F., to facilitate communications. The guide explains in easy-to-understand terms forest harvesting techniques. It was written not only to help woodlot owners understand the effects of their harvesting methods and to develop the most suitable harvesting method but also to aid them in assessing and applying the recommendations of their extension forester. A copy of the Guide is available from the Department.

The co-operators were sent a questionnaire asking them for their 1968 wood and maple syrup production and the amount of time and effort they had available for woods work in 1968. Out of 48 co-operators, there were 28 replies.

Records

1st January, 1968 to 15th May, 1969.	
A. No. of co-operators	53
B. Record of field visits	45
C. Total number of acres	5,431

DEPARTMENT AND ARBORETUM RESEARCH PROJECTS

In addition to the projects reported above, the Department is in receipt of several specific grants for research. These are listed below together with many unfunded projects that in time may become eligible for outside support.

1. Studies of *Betula* sp. Cyto-genetics and Taxonomy of the White-Barked Birches of Canada. Extensive herbarium and living collection in the Morgan Arboretum. (N.R.C. support).

(Man-years - 1) W. H. Brittain

1968-69 \$6,000

2. Urban Forestry Studies. The selection, use and demonstration of native shade trees for landscaping and beautification purposes (i.e. amenity). (Departmental financing).

(Man-years - $\frac{1}{8}$) Staff

3. Woodlot Management - Economic Levels. Demonstration of three levels of woodlot management intended for owners of differing income levels - classed as marginal, commercial and conservation. The three methods are also being used for demonstration purposes and to obtain data regarding their viability. (Departmental financing).

(Man-years - $\frac{1}{4}$) A.R.C. Jones, J.D. MacArthur

4. South-Western Quebec Woodlot Study - Technical assistance to owners of wooded lots. A study of the degree to which technical assistance can favourably affect returns and production from improved woodlot management. (Quebec A.R.D.A. support).

(Man-years - $1\frac{1}{4}$ professional, $\frac{1}{2}$ technical)

A. R. C. Jones, David Algar

1968-69 \$10,000

5. Management of Sugar Maple For Syrup Production. A general study with special attention to development of a young stand of sugar maple. Potentially long term, this work is now in its third year. One phase is the intensive management of sugar maple. (C.D.A. support).

(Man-years - $\frac{1}{4}$) J. D. MacArthur

1968-69 \$3,600

6. Maple Sap Collection Studies. Applied research involving plastic tubing systems for sap collection and featuring vacuum pumping systems. Objectives are to adopt, improve and develop most economic systems. (Q.A.R.C. support).

(Man-years - $\frac{1}{4}$) A.R.C. Jones, J.D. MacArthur

1968-69 \$3,500

7. Reforestation. Small scale plantations of both coniferous and broadleaved species in the Morgan Arboretum are producing interesting results. (Departmental financing).

(Man-years - $\frac{1}{4}$) J. D. MacArthur

8. Christmas Tree Culture and Marketing. Cultural methods such as pruning, shearing and special protection are being tested and developed with a view to optimizing returns. Our organization is co-operating

in observations of various Scots pine races, and in the special grafted clone study initiated by the Petawawa Forest Experimental Station tree breeding group. (Departmental financing).

(Man-years — $\frac{1}{8}$) J. D. MacArthur

9. Timber Stand Improvement. The Morgan Arboretum forest is under intensive management with regular cutting according to a management plan aimed at improvement in tree and stand quality and improved species composition. (Departmental financing with equipment grants from Terry Machinery, Chain Saw Division).

(Man-years — $\frac{1}{4}$) Staff

10. Woodlot Protection. Studies of various practices and use of materials for weed and grass control in plantation establishment, fire protection methods and water impoundment techniques (in co-operation with the Department of Agricultural Engineering). (Departmental financing).

(Man-years — 1/10) Staff

11. Multiple Use. The Morgan Arboretum forest is managed intensively for wood products. It is also used intensively for outdoor recreation by the Morgan Arboretum Association membership. Records of forest management and recreational activity constitute an important source of information on multiple use. (Departmental financing).

(Man-years — $\frac{1}{8}$) Staff

12. Community Ecology. Studies of animal activity in forest communities in 1) the Laurentians and 2) Central Newfoundland. (1. N.R.C. support, 2. Department of Forestry and Rural Development E.M.R.).

(Man-years — $\frac{1}{2}$ professional,
2-4 Technical) J. R. Bider

1. 1968-69 \$5,000
2. 1968-69 \$7,800

13. Effects of Rodents On Maple Operations. Studies of rodent damage to maple sap collecting devices and methods of control and protection of such installations. (Departmental financing with equipment grants from 3M and Lamb suppliers).

(Man-years — $\frac{1}{8}$) J. R. Bider

14. Survey of Turtle Populations in Stoneycroft Pond to determine carrying capacity, growth, etc. (Departmental financing).

(Man-years — 1/10) J. R. Bider

15. Effectiveness of Outdoor Tours in Teaching Conservation. To study by means of questionnaires and personal interviews of teachers whose classes are involved, the effectiveness of outdoor visits to the Arboretum in making school children aware of renewable natural resources. (Departmental financing).

(Man-years — 1/10) A.R.C. Jones, J.D. MacArthur, D. Algar

16. Woodlot Studies to Determine Potential Productivity of Soft Maple (*Acer spp.*) stands on poorly drained soils. In conjunction with the Quebec A.R.D.A. project (see item 4 above).

(Man-years — $\frac{1}{2}$) J. Ambrose, A.R.C. Jones

PUBLICATIONS

During the year members of the Department and others have prepared and published the following scientific articles, papers and reports: Algar, David. Guide to Woodlot Harvesting. *Morgan Arboretum Publication*, (in French and English) pp. 1-20, 1969.

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- Fire danger forecasts link meteorologist and forester in unique Quebec plan. *Pulp and Paper Magazine of Canada*. Sept. 6, 1968. pp. 39-40.
- Government-backed company harvests pulpwood for Prince Albert Mill. *Pulp and Paper Magazine of Canada*, Sept. 6, 1968. pp. 46-48.
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Most of the above articles in reprint form are available on request from the Department office.

FUTURE PLANS

The Department is involved in a Committee, chaired by Professor R. S. Broughton, Department of Agricultural Engineering, now studying a new orientation for the Faculty of Agriculture. This Committee was formed at the instigation of several graduate students and staff who felt that there was a need to broaden the scope of the Faculty with more emphasis on Resource Development and the renewable natural resources. The Department welcomes this further opportunity to participate in the planning for a new and stronger emphasis on the renewable resources of soil, water, forests and wildlife as well as the human resources connected with them. The Committee will be meeting through the summer and it is hoped to produce a final report by the fall.

This annual report has been a team effort and the contribution of all members of the staff in its compilation is gratefully acknowledged.

A. R. C. Jones,
Chairman,
Department of Woodlot Management.

31st May, 1969

FORM OF BEQUEST

The Directors wish to remind friends of the Morgan Arboretum Association that the financing of the Association's activities is dependent on their generosity to provide funds to maintain and expand conservation in Canada.

It is suggested to those in a position to do so, the addition to their will of a particular legacy in the following form:—

“I bequeath to the Morgan Arboretum Association, Macdonald College, as a particular legacy, and free from all succession and death duties of any kind, the sum of \$.....”

Inquiries concerning bequests, other gifts to the Association, or additional information, should be addressed to:

The Secretary-Treasurer,
Morgan Arboretum Association,
Macdonald College, P. Q.

DEPARTMENT OF WOODLOT MANAGEMENT AND MORGAN
ARBORETUM and WOODLAND DEVELOPMENT
ASSOCIATION

Interim Statement of Income and Expenditure
June 1, 1968 to April 30, 1969

Income

Contributions from members (including gate receipts)	\$ 41,878.00 ^a
Income from sales	15,044.00
Interest on Reserve	2,001.00
McGill Contribution	20,000.00
	\$78,923.00

Expenditure

Ordinary	\$ 13,638.00
Fixed	775.00
Salaries and wages (including employee benefits) ..	60,444.00
	\$74,857.00

Estimated Income and Expenditure 1960-70

Contribution from members	40,000.00
Income from sales (as per Budget)	20,000.00
Interest on Reserve	2,000.00
McGill Contribution	22,000.00
	\$84,00.00

Estimated Expenditure

Budget for 1969-70	\$114,505.00
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^{a h} Including \$10,000. transferred from McGill Fund Council

W. C. Shipley
Secretary-Treasurer.

May 31, 1969.

